

Relationship Between 3rd Grade Reading Performance & Graduation in SC



**SC EDUCATION
OVERSIGHT COMMITTEE**

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Relationship between 3rd Grade Reading Performance and Graduation in South Carolina

There is substantial evidence supporting the commonly held belief that strong positive relationship exists between reading proficiency and high school graduation. In 2004, the Education Oversight Committee examined the relationship between reading proficiency, as measured by the performance of eighth graders on the Palmetto Achievement Challenge Test (PACT), and four –year graduation rates. Cohorts of entire grades were used for the study in the absence of a student ID system. The relationship between graduation rates and reading proficiency was found to be statistically strong and robust. If a student did not read proficiently in the eighth grade, there was a 50 percent change they would not graduate on-time four years later. Despite its limitations matching individual students, the study also pointed out the need to develop reading policy that was aimed at developing reading proficiency earlier in a child's academic career.

In April of 2011 The Annie E. Casey Foundation and the Center for Demographic Analysis at the State University of New York at Albany released a study, *Double Jeopardy*, evaluating the link between third grade reading skills and poverty and high school graduation. The longitudinal study used a national database of 3,975 students born between 1979 and 1989. "The researchers divided the children into three reading groups which correspond roughly to the skill levels used in the National Assessment of Educational Progress (NAEP): proficient, basic and below basic." The children were also separated into three income categories: those who have never been poor, those who spent some time in poverty and those who have lived more than half the years surveyed in poverty." The findings of the study were:

- One in six children who are not reading proficiently in third grade do not graduate from high school on time, a rate four times greater than that for proficient readers.
- The rates are highest for the low, below-basic readers: 23 percent of these children drop out or fail to finish high school on time, compared to 9 percent of children with basic reading skills and 4 percent of proficient readers.
- Overall, 22 percent of children who have lived in poverty do not graduate from high school, compared to 6 percent of those who have never been poor. This rises to 32 percent for students spending more than half of their childhood in poverty.¹

During the 2013 session of the South Carolina General Assembly, three pieces of legislation were introduced to improve third grade reading proficiency. The legislation all addressed the critical linkage between third grade reading proficiency and the future success of students.

Consequently, the question was raised: what is the relationship between third grade reading performance and eventual graduation in South Carolina?

Data Analysis:

The first step was to analyze the performance of third grade students on the English language arts test of the Palmetto Achievement Challenge Test (PACT), which was the precursor to the Palmetto Assessment of State Standards (PASS). This step involved going back to the 2000 cohort of 3rd graders in the state of South Carolina. In 2000 there were approximately 52,175 students who had 3rd grade PACT scores. PACT had five achievement levels: Below Basic 1, Below Basic 2, Basic, Proficient and Advanced. Below Basic 1 was the lowest achievement

¹ Hernandez, Donald J., et. al. *Double Jeopardy*. April 2011. Published by The Annie E. Casey Foundation.
<<http://www.aecf.org/~media/Pubs/Topics/Education/Other/DoubleJeopardyHowThirdGradeReadingSkillsandPoverty/DoubleJeopardyReport040511FINAL.pdf>>.

level with Advanced being the highest. Table 1 below shows the percentage of students scoring at each level of PACT ELA in 2000.

Table 1. 2000 PACT 3rd Grade English Language Arts Scores

Performance Level	Number of Students	Percentage of All Students
Below Basic 1	8,441	16.18%
Below Basic 2	4,974	9.53%
Basic	17,952	34.41%
Proficient	18,750	35.94%
Advanced	<u>2,058</u>	3.94%
TOTAL:	52,175	

Not until 2006 did students have a unique student identifier. Therefore, to determine if these 52,175 students progressed across grades and graduated, demographic information from student records was used to identify children through time. Used for identification purposes were the child's name, date of birth, gender, and ethnicity. If a child changed his or her name, then the child likely was not matched. The data were carefully scrutinized to look at retention throughout the continuum.

Of the 52,175 students in the initial cohort, 32,117 were able to be identified as being enrolled in public schools in South Carolina in 2008, which equates to 11th grade if students were routinely promoted. As Table 2 illustrates, approximately 44 percent of the students who initially scored Below Basic 1 were still enrolled as compared to 73 percent of students who initially scored Advanced. The students who were no longer enrolled had either dropped out of school, moved away, or were unable to be identified.

Table 2. Cohort Enrolled in 11th Grade in 2008

Performance Level	Number of Students	Number of Students	% of Original Cohort
Below Basic 1	8,441	3,742	44.33%
Below Basic 2	4,974	2,684	53.96%
Basic	17,952	11,068	61.65%
Proficient	18,750	13,111	69.93%
Advanced	<u>2,058</u>	<u>1,512</u>	73.47%
TOTAL:	52,175	32,117	

Looking at these 32,117 students, the analysis addressed three questions. Having identified 32,117 students in 11th grade from the original 3rd grade cohort, how many graduated the following spring, 2009 or on time? How many graduated in 2009 or 2010, on-time or at least within five years? And, is there a statistically significant relationship between the 3rd grade ELA scores of these students and their likelihood of graduating on-time or within five years?

Of the 32,117 students in 11th grade, approximately 24,550 or 76 percent graduated in the spring of 2009 (Table 3). However, for the students who scored Below Basic 1 on their 3rd grade ELA PACT test, only 45 percent graduated while 87 percent of those who scored Proficient graduated and 91 percent of those who scored Advanced graduated. For students who could be traced from 2000 to 2009, is there a relationship between 3rd grade reading performance in 2000 and graduation in 2009? The answer is yes. Using a Chi-Square analysis,

there was a statistically significant relationship between 3rd grade ELA performance and the likelihood of graduating.

Table 3. Initial Cohort Restricted by Graduating in 2009

3rd Grade ELA Performance, 2000	Did NOT Graduate 2009	Graduated 2009	Total
Below Basic 1	2,071 (55.34%)	1,671 (44.66%)	3,742
Below Basic 2	981 (36.55%)	1,703 (63.45%)	2,684
Basic	2,683 (24.24%)	8,385 (75.76%)	11,268
Proficient	1,700 (12.97%)	11,411 (87.03%)	13,111
Advanced	<u>132</u> (8.73%)	<u>1,380</u> (91.27%)	<u>1,512</u>
TOTAL:	7,567	24,550	32,117

Chi-Square 3355.0936 <.0001

A second question was raised. Is there a difference in the percent of students who graduated in 2009 or 2010 as a function of 3rd grade reading performance in 2000? In essence, looking at a five-year graduation rate, did students scoring at the lowest level on the 3rd grade PACT ELA test graduate at a comparable level to their peers? The answer is no. While 80 percent of the original third grade cohort graduated in 2009 or 2010, only 56 percent, of the students who scored Below Basic 1 on the ELA PACT test graduated in 2009 or 2010. And, using a Chi-Square analysis, there was a statistically significant relationship between 3rd grade ELA performance and the likelihood of graduating within five years.

Table 4. Initial Cohort Restricted by Graduating in 2009 or 2010

3rd Grade ELA Performance, 2000	Did NOT Graduate 2009 or 2010	Graduated 2009 or 2010	Total
Below Basic 1	1,654 (44.20%)	2,088 (55.80%)	3,742
Below Basic 2	725 (27.01%)	1,959 (72.99%)	2,684
Basic	2,264 (20.46%)	8,804 (79.54%)	11,068
Proficient	1,596 (12.17%)	11,515 (87.83%)	13,111
Advanced	<u>132</u> (8.73%)	<u>1,380</u> (91.27%)	<u>1,512</u>
TOTAL:	6,371	25,746	32,117

Chi-Square 2087.9909 <.0001

Another analysis was done to look at those students who repeated a grade in the 3-8 grade span and scored Below Basic 1 or 2 on the PACT ELA test. Table 5 below shows that 58 percent of the students who were retained in 3rd grade graduated as compared to 39 percent of the students who were retained in 8th grade. In essence, if a student is to be retained for a grade then the “earlier-the-better.”

Table 5. Students Retained Once and Graduation Rates

Grade Repeated	Did NOT Graduate (%)	Number Graduated (%)	Total
3	184 (41.63%)	258 (58.37%)	442
4	122 (49.39%)	125 (50.61%)	247
5	74 (48.37%)	79 (51.63%)	153
6	95 (47.26%)	106 (52.74%)	201
7	100 (55.87%)	79 (44.13%)	179
8	58 (61.05%)	37 (38.95%)	95

The analysis also revealed that there were 200 students who repeated two grades. Looking at the 2011 graduation data file, it was determined that 13 of these 200 students graduated in 2011, and an additional 13 students were determined to have graduated in 2010. Consequently, Table 6 below summarizes the initial results of the 2000 ELA PACT results.

Table 6. Summarizing Graduates as a function of 2000 PACT 3rd Grade ELA Reading

3rd Grade ELA Performance, 2000	Initial Number	2005 Students Retained No more than One Grade (%)	Students Graduated in 2009	Students Graduated in 2010	Students Graduated in 2011	Total Graduates
Below Basic 1	8,441	5,665 (67.1%)	1,671	417+7	8	2,103 (37.1%)
Below Basic 2	4,974	3,679 (74.1%)	1,703	256+2	2	1,963 (53.3%)
Basic	17,952	13,696 (75.8%)	8,385	419+4	3	8,811 (64.3%)
Proficient	18,750	14,967 (79.8%)	11,411	104	0	11,515 (76.9%)
Advanced	2,058	1,672 (81.2%)	1,380	0	0	1,380 (82.5%)
TOTAL:	52,175	39,679	24,550	1,209	13	

Because there was attrition between 2000 and 2005, it is also true that some students were “lost” by moving, dropping out of school, etc. Thus, the percentage that 37.1% of children who scored Below Basic 1 and graduated is an underestimate, but how much of an underestimate?

Finally, an analysis was conducted to attempt a very rough estimate of the number of students who persevered to the end of 2009, the first year that students in the cohort could graduate. The analysis used the loss from 2000 to 2005 to project four more years and estimate the number at 2009. For example, the rate of loss of students in the Below Basic 1 category from 2000 to 2005 was 32.9%. Extending this out for four more years, the projected loss for the total nine-year

period was estimated at .592 (.329 X 1.8). The figure .592 is considered a “loss rate” with .408 considered a “perseverance rate.”

Table 7 shows below an estimated graduation rate using the initial problems in locating all children who scored Below Basic 1 on 3rd grade PACT ELA in 2000. Children who score Below Basic 1 in 3rd grade have an estimated graduation rate of 61.1 percent.

Table 7. Estimated to Have Persevered to Have Graduated in 2009
as a function of 2000 PACT 3rd Grade ELA Reading

3rd Grade ELA Performance, 2000	Initial Number	2005 Students Retained No more than One Grade (%)	Estimated to Have Graduated 2009	Graduated All	Graduation %
Below Basic 1	8,441	5,665 (67.1)	3,444	2,103	61.1
Below Basic 2	4,974	3,679 (74.1)	2,655	1,963	73.9
Basic	17,952	13,696 (75.8)	10,132	8,811	87.0
Proficient	18,750	14,967 (79.8)	11,932	11,515	96.5
Advanced	2,058	1,672 (81.2)	1,356	1,380	>100
TOTAL:	52,175	39,679	29,159	25,772	

Conclusion:

1. Students who scored at Below Basic 1 on the 2000 PACT ELA test were less likely to be able to be identified as still being enrolled in public schools in South Carolina and were less likely to graduate than all other students. There was a statistically significant relationship between 3rd grade PACT ELA scores in 2000 and the likelihood that the student graduated in 2009 or 2010.
2. Using the various methods of estimating the graduation rate for students who scored Below Basic 1 on the 2000 PACT ELA test:

About 20 percent (19.8%) of students who initially scored Below Basic 1 on the 2000 3rd Grade PACT ELA assessment and who could be located graduated in 2009.

About 37 percent of the students who initially scored Below Basic 1 on the 2000 3rd Grade PACT ELA assessment and who could be located graduated in 2009, 2010 and 2011 (Table 6).

Finally, projecting over time the mobility of students based upon actual enrollment declines, approximately 61 percent of the students who scored Below Basic 1 on the 2000 3rd Grade PACT ELA assessment are projected to have persevered to graduate (Table 7).

3. The percent of students graduating from high school decreases from 58.37% for 3rd grade repeaters, to 38.95 % for those students who repeated grade 8. In essence, if a student is to be retained for a grade then the “earlier-the-better.”